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John C. Stennis Space Center
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COMPLIANCE IS MANDATORY

John C. Stennis Space Center
ALLOWABLE LEAK STANDARD

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1.0 PURPOSE

This John C. Stennis Space Center (SSC) standard (SSTD) outlines the allowable leakage for existing gas distribution systems at SSC. It defines the leakage which is acceptable and those which require repair. Allowable leakage for new systems is covered under existing standards.

2.0 APPLICABILITY

This standard applies to the following gases in the SSC facility systems and equipment: Nitrogen, Helium, High Pressure Air, Oxygen, and Hydrogen.

3.0 REFERENCES

All references are assumed to be the latest version unless otherwise indicated.

SPR 8715.1, *SSC Safety and Health Program Requirements*
SPR 1440.1, *SSC Records Management Program Requirements*
SSTD-8070-0005-CONFIG, *SSC Preparation, Review, Approval, and Release of SSC Standards*

4.0 LEAK CATEGORIES

This section describes the leak categories with regard to their repair. There are two types of leaks, audible and non-audible. The area supervisor shall be responsible for categorizing leaks.

4.1 Categories of Audible Leaks

a. Category 1: Leak shall be repaired.
Hydrogen and oxygen fall into this category. Helium and nitrogen may fall in this category, if their presence is hazardous to personnel - asphyxiation.

b. Category 2: Economically justifiable leak shall be repaired.
Economic impact and cost repair analysis as described in sections XX and XX shows that the leak repair cost is recoverable over a three-year period. Repair may be justified at time of discovery or economic analysis may indicate delay of repair until normal maintenance or other system rework is in progress.

c. Category 3: Leak shall not be repaired.
Leak is not hazardous to personnel, and leak repair cost is not recoverable over a three-year period. Leak shall be monitored to determine if it later becomes a category 1 or 2 leak.

4.2 Categories of Non-Audible Leaks

a. Class I: Steady formation of small, long persisting bubbles, frequently too small to see as individual bubbles, thereby creating a characteristic milky appearance

that may build up to a shaving cream lather-like appearance of fuzz (0.001 to 1.3 standard cubic inches per minute [scim]).

b. Class II: Mixture of random sized bubbles of moderate persistence (1.3 to 4.0 scim).

c. Class III: Large, fast-forming bubbles of short persistence, most of which break as the next one forms (4.0 to 50.0 scim).

d. Blowing: Bubble formation does not take place because or large gas flow.

Responsible engineer will make determination if Class I or II leak(s) need to be repaired. Class III and blowing leaks shall be repaired if gas is hydrogen or oxygen. If gas is not hydrogen or oxygen, responsible engineer will make determination if leak(s) need to be repaired.

5.0 ECONOMIC IMPACT

Determine the flow rate for the leak. Calculate the dollar amount in lost gas over a three-year period. The current price of gases purchased at SSC may be obtained from the SSC Technical Services Contractor Propellant Manager.

6.0 REPAIR COST

Repair cost shall include but not be limited to the cost of material, shop support, and gas bled from the pipe or system to make necessary repair(s).

7.0 RECORDS AND FORMS

Records and forms required by the procedures of this standard shall be maintained in accordance with SPR 1440.1. All records and forms are assumed to be the latest edition unless otherwise indicated. Forms may be obtained from the SSC Electronic Forms repository or from the National Aeronautics and Space Administration (NASA) SSC Forms Management Officer. Quality Records are identified in the SSC Master Records Index.

8.0 ACRONYMS AND ABBREVIATIONS

NASA	National Aeronautics and Space Administration
scim	standard cubic inches per minute
SSC	John C. Stennis Space Center
SSTD	John C. Stennis Space Center Standard
SPR	Stennis Procedural Requirements